CLAIMS

1. An electric filter comprising a plurality of thin film bulk acoustic resonators (FBARs) linked in a series/parallel arrangement wherein each resonator is made up of a thin piezoelectric layer sandwiched between two metal electrodes and other layers of materials and in which the thicknesses of the non-piezoelectric layers in the FBAR resonators in the filter is varied one-from another.

2. An electric filter as described in claim 1, wherein the piezoelectric sandwich structure is supported on a thin membrane layer.

3. An electric filter as described in claim 1, wherein the piezoelectric sandwiched structure is supported on an acoustic reflective stack.

4. An electric filter as described in any preceding claim, wherein the layer whose thickness is varied from one FBAR to another is the top electrode.

5. An electric filter as described in any one of claims 1 to 3, wherein the layer whose thickness is varied from one FBAR to another is the bottom electrode.

6. An electric filter as described in any one of claims 1 to 3, wherein the layer whose thickness is varied from one FBAR to another is an underlying membrane.

7. An electric filter as described in any one of claims 1 to 3, wherein the layer whose thickness is varied from one FBAR to another is an overlying dielectric layer.

8. An electric filter as described in any one of claims 1 to 3, wherein the layer whose thickness is varied from one FBAR to another is an overlying metal layer.

9. An electric filter as described in any preceding claim, wherein the piezoelectric material is zinc oxide.

10. An electric filter as described in any one of claims 1 to 8, wherein the piezoelectric material is lead titanate zirconate.

11. An electric filter as described in any one of claims 1 to 8, wherein the piezoelectric material is aluminium nitride.

12. An electric filter as described in any one of claims 1 to 8, wherein the piezoelectric material is substantially lead scandium tantalum oxide.

13. An electric filter as described in any one of claims 1 to 8, wherein the piezoelectric material is substantially bismuth sodium titanium oxide.

14. An electric filter as described in any preceding claim, wherein the metal electrodes are substantially gold.

15. An electric filter as described in any one of claims 1 to 13, wherein the metal electrodes are substantially aluminium.

16. An electric filter as described in any one of claims 1 to 13, wherein the metal electrodes are substantially platinum.

17. An electric filter as described in claim 6, wherein the underlying membrane is silicon nitride.

18. An electric filter as described in claim 6, wherein the underlying membrane is silicon oxide.

19. An electric filter as described in claim 7, wherein the overlying dielectric layer is silicon nitride.

20. An electric filter as described in claim 7, wherein an overlying dielectric layer is silicon oxide.

21. An electric filter as described in any preceding claim, wherein the variation in the thickness of one of the layers is produced by etching by excimer laser pulses.

22. An electric filter as described in any one of claims 1 to 20, wherein the variation in the thickness of one of the layers is produced by wet etching.

23. An electric filter as described in any one of claims 1 to 20, wherein the variation in the thickness of one of the layers is produced by ion milling.

24. An electric filter as described in any one of claims 1 to 20, wherein the variation in the thickness of one of the layers is produced by reactive ion etching.

25. An electric filter comprising at least one FBAR in series and at least one FBAR in parallel, each FBAR having a piezoelectric layer sandwiched between two electrodes wherein the thicknesses of one or more non-piezoelectric layers in the series FBAR is different to that in the parallel FBAR.

26. An electric filter according to claim 25, wherein the thickness of at least one electrode is different between the FBAR in series and the FBAR in parallel.

27. An electric filter according to claim 25 or claim 26, wherein at least one additional layer is provided over the top electrode or under the bottom electrode.

28. An electric filter according to claim 27 wherein the thickness of the additional layer is different between the FBAR series and the FBAR in parallel.

29. An electric filter according to any preceding claim comprising a plurality of FBARs linked in series and a plurality of FBARs linked in parallel.

30. An electric filter substantially as hereinbefore described with reference to the accompanying drawings.